

### REMARKS

Claims 1-19 and 33-45 are pending in this application and have been rejected. The claims have not been amended.

The specification has been amended to correct a typographical error. Specifically, paragraph [0080] has been amended to recite substrate (101) instead of substrate (201). As noted in the paragraphs prior to paragraph [0080] and the accompanying Figures, the substrate is consistently referred to as (101). Paragraph [0080] accidentally referred to the substrate as (201). Based on the previous paragraphs and the Figures, though, the skilled artisan would have understood that the use of (201) in paragraph [0080] was a typographical error of (101). This understanding would have been supported by the fact that (201) was consistently used to refer to the bond pads in these paragraphs and in the accompanying Figures.

### Specification

The Office has objected to the specification under 35 U.S.C. § 132 on the basis that the amendment to the claims introduces new matter into the disclosure. The Office argues that the new matter is that the substrate can be a leadframe substrate. The Office accordingly requires cancellation of this new matter.

Applicant respectfully disagrees with this objection. To begin with, Applicant previously amended the claims and not the specification. So the initial disclosure in the specification has never been changed. And since all of the subject matter in the specification remains as it was originally filed, no new matter has been added.

Applicant notes that the specification has been concurrently amended, as indicated above. Such an amendment could not introduce new matter into the specification since it only corrected a typographical error.

Thus, Applicant respectfully requests withdrawal of this objection. And Applicant can not reply with the requirement to cancel the new matter since no new subject matter has ever been added to the specification.

### 35 U.S.C. §112 Rejection

The Office has rejected claims 1, 15, 19, 37, and 41 under 35 U.S.C. § 112, ¶ 1, as failing to comply with the written description requirement for the reasons noted on pages 2-3 of the Office Action. Applicant respectfully traverses this rejection.

Citing paragraph [0080], the Office argues that the only mention of a leadframe substrate is in Figure 28 in which the chip scale package is attached to a leadframe. The Office further argues that paragraph [0041] of the specification states that the substrate can be made of any known semiconductor substrate and, therefore, could not be a leadframe.

Applicant respectfully submits that the Office has both misinterpreted the specification and overlooked some disclosure in the specification. As to misinterpretation, paragraph [0041] of the specification discusses a substrate 100. On the other hand, the substrate described in paragraph [0080] is substrate 101.

More importantly, the Office has overlooked the written description for the claimed limitation in paragraphs [0075] through [0080]. In paragraph [0075], Applicant notes that substrate 101 is provided with bond pads 201. Applicant explicitly describes that

[t]he substrate 101 can be made of any suitable material. One example of a suitable material for the substrate is high glass transition materials like bis-maleimide triazine (BT) epoxy.

The substrate 101 is then attached to chip 400 and the resulting structure is shown in Figure 27. *See paragraphs [0076-0080]*. This resulting structure is then encapsulated as shown in Figure 28. Figure 28 describes that the substrate can be BT or a molded leadframe.

Combining the disclosure of paragraph [0075] and Figure 28, the skilled artisan would have noted that the substrate 101 could have been either BT or a molded leadframe. In other words, another example of a suitable material for the substrate 101 would be a molded leadframe. While a molded leadframe is not explicitly mentioned in the text of the specification, it need not be: both the text and the Figures of the specification can provide a written description of the claimed invention.

Thus, the Office has not substantiated that the rejected claims have failed to comply with the written description requirement. Accordingly, Applicant respectfully requests withdrawal of this rejection.

#### Response to Arguments

The Office notes that since the leadframe claim limitation was new matter, all arguments addressed to that limitation were not considered and the previous rejection stands as written. Applicant respectfully disagrees.

These arguments, and the limitation itself, should have been considered. In fact, under the Office's own guidelines, this limitation and the associated arguments have to be considered.

If new matter is added to the claims, the examiner should reject the claims under 35 U.S.C. § 112, first paragraph - written description requirement. *In re Rasmussen*, 650 F.2d 1212, 211 USPQ 323 (CCPA 1981). The examiner should still consider the subject matter added to the claim in making rejections based on prior art since the new matter rejection may be overcome by applicant.

*See M.P.E.P. § 2163.06 (I) (emphasis added).* Thus, the Office should have not ignored this limitation and its associated arguments. Accordingly, as noted in the concurrently filed Request for Withdrawal of Finality, Applicant requests withdrawal of the final Office Action and consideration of this limitation and its associated arguments.

#### 35 U.S.C. §102 Rejection

Claims 1-5, 7, 10, 37-38, and 40 have been rejected under 35 U.S.C. §102(b) as being clearly anticipated by Higashi et al. (U.S. Patent No. 5,918,113) for the reasons set forth on pages 2-3 of the Office Action. Applicant respectfully traverses this rejection.

The rejected claims contain several limitations relevant to this rejection. The first limitation is the presence of a leadframe substrate. The second limitation is that the conductive particles comprise a metal with an insulating layer.

The Office, however, has not substantiated that Higashi et al. anticipates either of these claim limitations. As to the first limitation, the Office argues that the device illustrated in Figures 10a through 11 describe such a limitation. The devices in these Figures contain a substrate 10, which Higashi et al. describe as being a circuit board 10, including a flexible substrate such as FPC, TAB, or PCB. *See column 3, lines 30-37.* But the Office's argument has not shown how such a disclosure anticipates a leadframe substrate.

As to the second limitation, the Office alleges that the conductive particles of Higashi et al. comprise a metal with an insulating layer, citing to column 3, lines 49+. A careful reading of this section, however, would lead the skilled artisan to the opposite conclusion. Higashi et al. describe an adhesive film 20 containing conductive particles 22 that are dispersed within adhesive component 21. The conductive particle may be a “nickel ball without or without gold plating thereon, or a resin ball with gold plating thereon.” *See column 3, lines 50-60.* This disclosure would lead the skilled artisan to conclude that the conductive particle has a metal layer, not an insulating layer as claimed. So the Office has not shown how this section of Higashi et al. discloses, as recited in the second limitation, a metal with an insulating layer thereon.<sup>1</sup>

The Office, therefore, has not substantiated that Higashi et al. anticipates every limitation in the rejected claims. Consequently, Applicant respectfully requests withdrawal of this ground of rejection.

#### 35 U.S.C. § 103 Rejections

Claims 6, 8-9, 11, 12, 14-16, 18-19, 33-36, 39, and 41-45 have been rejected under 35 U.S.C. §103 as being unpatentable over Higashi et al. in light of several different prior art references for the reasons set forth on pages 3-18 of the Office Action. Applicant respectfully traverses these rejections for the reasons below.

For all of these rejections, the rejected claims contain a limitation that the Office has not shown to be described by Higashi et al. That limitation is the presence of a leadframe substrate.

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<sup>1</sup> In fact, it would appear that the Office recognizes this fact because it admits on page 8 of the Office Action that Higashi et al. fails to “teach the conductive particles as comprising a metal and an insulating layer.”

Despite the Office's arguments set forth in pages 3-18 of the Office Action, these arguments fail to substantiate how this limitation would have been suggested to the skilled artisan in light of Higashi et al., whether alone or combined with the various prior art references.

For each individual rejection, Applicant disagrees with that rejection for the reasons detailed below.

1. The Office has rejected claim 6 as being unpatentable over Higashi et al. in view of Applicant's Admitted prior art (APA). The Office recognizes that Hagashi et al. fail to teach an RDL pattern and an insulating layer covering a portion of the RDL pattern. The Office contends that it would have been obvious to modify Hagashi et al. in light of the APA to arrive at the claimed invention because RDL patterns allow for greater flexibility and take advantage of unused space. But the APA describes that the devices and RDL patterns in Figures 1-3 have many disadvantages. *See paragraphs [0010] through [0013]*. So the skilled artisan would have been motivated against using the RDL patterns in the devices of Figures 1-3 because some of these disadvantages would have been introduced into the device of Higashi et al.

2. The Office has rejected claims 8-9 as being unpatentable over Higashi et al. alone. The Office acknowledges that Higashi et al. fail to describe (1) a stud bump that comprises Cu and (2) that the stud bump is a coined stud bump, but argues that these features would have been obvious.

The Office argues that it would have been obvious to substitute Cu for the Au stud bump taught by Higashi et al. since they are recognized in the art as equivalents and Cu is cheaper to use than Au. But the Office has submitted no evidence showing that using Cu and Au are known in the art to be equivalents when used in stud bumps. *See M.P.E.P. § 2144.06*.

The Office also argues that it would have been obvious to optimize the method of forming the stud bump. But the Office has not shown, as required, that the method of forming the stud bump is a result-effective variable. Such as showing is required before the Office can argue that it would have been obvious for the skilled artisan to try and optimize it. *See M.P.E.P. § 2144.06 (II) (B)*.

3. The Office has rejected claims 11-16, 18, 19, 33-34, and 36 as being unpatentable over Higashi et al. in view of Nishida et al. (U.S. Patent No. 6,926,796) and/or Kaneda et al. (U.S. Patent No. 6,223,429).

The Office recognizes that Higashi et al. fails to teach that the conductive particles comprise metal and an insulating layer, but argues that such a feature would have been obvious in light of Nishida et al. and/or Kaneda et al. because the latter reference teaches that this type of conductive particle improves the insulating property in the lateral direction. But the Office has not shown that such a modification (placing an insulating layer on the conductive particles 22 of Higashi et al.) would have obvious to the skill artisan in light of the fact that the conductive particles 22 of Higashi et al. not only serve as a conductor between electrode terminals 32 and terminal contacts 12a, but also become embedded between these two components, wedge them together, and prevent separation. *See column 4, lines 30-42*.

4. The Office has rejected claim 17 and 35 39 as being unpatentable over Higashi et al. in view of Nishida et al. (U.S. Patent No. 6,926,796) and/or Kaneda et al. (U.S. Patent No. 6,223,429), and further in view of APA. Since this rejection is a combination of the references described above, the arguments outlined above apply equally to this rejection.

5. The Office has rejected claim 41-42, 44-45 as being unpatentable over Higashi et al. in view of Sawamoto (U.S. Patent No. 6,426,566), Ding et al. (U.S. Patent No. 6,737,300) or

Shibata (U.S. Patent No. 6,461,890) and also in view of Nishida et al. (U.S. Patent No. 6,926,796) and/or Kaneda et al. (U.S. Patent No. 6,223,429). The Office recognizes that Higashi et al. fails to teach that conductive particles 22 contact both the stud bump and the bond pad, but argues that Sawamoto, Ding, and Shibata all teach this feature and it would have been obvious to incorporate this feature in Higashi et al. because it is much simpler to apply an adhesive particles throughout than to align the conductive particles on one side of the adhesive. But such an argument ignores the fact that Higashi et al. purposefully aligns the conductive particles on one side of the adhesive. *See column 3, lines 45-58*. And a proposed modification cannot change the principle of operation of a reference. *See M.P.E.P. § 2143.01 (VI)*.

6. The Office has rejected claim 43 as being unpatentable over Higashi et al. in view of Sawamoto (U.S. Patent No. 6,426,566), Ding et al. (U.S. Patent No. 6,737,300) or Shibata (U.S. Patent No. 6,461,890) and also in view of Nishida et al. (U.S. Patent No. 6,926,796) and/or Kaneda et al. (U.S. Patent No. 6,223,429), and further in view of APA. Since this rejection is a combination of references described above, the arguments outlined above apply equally to this rejection.

Thus, the Office has not substantiated that the rejected claims would have been obvious to the skilled artisan in light of Hagashi et al., whether alone or in view of the cited references. Accordingly, Applicant respectfully requests withdrawal of this ground of rejection.


### CONCLUSION

For the above reasons, Applicant respectfully requests the Office to withdraw the pending grounds of rejection and allow all the pending claims.



If there is any fee due in connection with the filing of this Amendment, including a fee for any extension of time not accounted for above, please charge the fee to our Deposit Account No. 50-0843.

Respectfully Submitted,

By   
KENNETH E. HORTON  
Reg. No. 39,481

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